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Some Ontario workers at increased risk of lung cancer

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Highlights

- Based on results from the Occupational Disease Surveillance System (ODSS) in Ontario, workers employed in construction, transport equipment operating (e.g. truck drivers) and mining occupations have a higher risk of lung cancer than workers in other occupations.
- Workplace exposures cause about 15% of lung cancers diagnosed in Canada each year.
- Efforts to reduce workplace exposures along with improved screening and prevention efforts in clinical settings can help reduce the burden of lung cancer for workers in hazardous industries.

Ontario workers in construction, transport equipment operating (e.g., truck drivers) and mining-related occupations have a higher lung cancer risk than workers in all other occupations tracked by the Occupational Disease Surveillance System (ODSS) over the past 30 years. The ODSS is a province-

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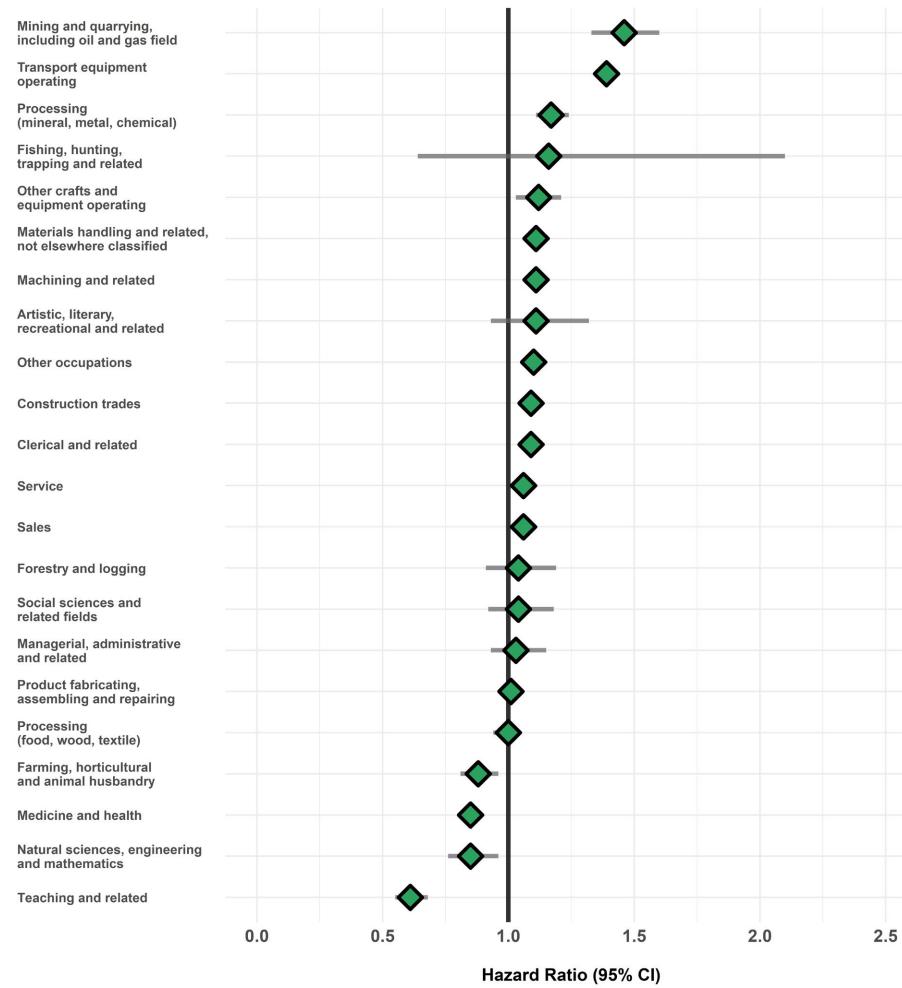
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wide occupational cancer and chronic disease surveillance initiative.

Workers employed in mining occupations were 1.5 times as likely to be diagnosed with lung cancer, having the highest risk of any overall group (see figure) compared to all other workers in the ODSS. Transport equipment operators were 1.4 times as likely to be diagnosed with lung cancer and construction trades workers were 1.1 times as likely to be diagnosed.

Figure Data Table

Risk of lung cancer among workers employed in specific occupation groups compared to all others, Occupational Disease Surveillance System (ODSS), 1983–2016 (n=2.1 million)



Note: The hazard ratio is an estimate of the average time to diagnosis among workers in each industry/occupation group divided by that in all

others during the study period. Hazard ratios above 1.00 indicate a greater risk of disease in a given group compared to all others. Estimates are adjusted for birth year and sex. The width of the 95% Confidence Interval (CI) is based on the number of cases in each group (more cases narrows the interval).

However, within these broad groups, certain jobs carried much higher risk. Insulators in construction trades were 2.4 times as likely to be diagnosed with lung cancer, while construction workers in excavating and paving occupations

were 1.5 times as likely to be diagnosed. Similarly, workers in railway transport were 1.2 times as likely to be diagnosed with lung cancer and motor transport workers were 1.5 times as likely to be diagnosed.

In Canada, lung cancer is the leading cause of cancer death in men and women. It is mostly caused by smoking, and prevention efforts have largely focused on tobacco control. However, based on the Burden of Occupational Cancer Project, [1] approximately 15% of lung cancers diagnosed in Canada each year are caused by exposure to known lung carcinogens in the workplace. Exposure to asbestos, crystalline silica, diesel engine exhaust, and metal fumes (i.e., chromium and nickel compounds in welding) are primarily responsible for occupational cases of lung cancer.

Workers in construction trades may be exposed to a wide range of lung carcinogens, including diesel engine exhaust from equipment, silica in construction materials (e.g., concrete, cement and abrasives), and asbestos fibres in building materials. Many construction workers can be exposed to asbestos during renovation, repair, or demolition of older buildings. Coal-tar pitch is a known lung carcinogen used in some roofing and paving processes. Painting is also recognized as a high risk occupation for lung cancer, possibly due to various hazardous chemicals in paint pigments and resins.

Workers in the transport equipment operating sector may be exposed to high levels of diesel engine exhaust if they work in or around diesel-powered equipment. Work related to mining and quarrying has consistently shown increased lung cancer risk from a number of hazards, including crystalline silica, radon, asbestos, and diesel engine exhaust.

Unfortunately, little attention is paid to occupational exposures in primary care settings, where tobacco tends to be the most recognized risk factor for lung cancer. However, the ODSS shows elevations in lung cancer risk that cannot be explained by smoking patterns alone. Moreover, some workplace exposures can interact with tobacco smoking in the body to create an even greater cancer risk to workers. Therefore, policy-makers and clinicians must pay greater attention to occupational exposures among workers in hazardous industries to improve lung cancer prevention.

The Occupational Cancer Research Centre leads the ODSS project. The ODSS follows the cancer and chronic disease diagnoses of over 2 million workers in Ontario by combining workers' compensation claims and several health data sources from the past 30 years. It compares disease rates to a large population of other workers in hazardous industries with similar socio-economic characteristics. More details on the ODSS and its key results are available on the project's website: odsp-ocrc.ca .

References

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OCCUPATION GROUP	HAZARD RATIO	95% LOWER CONFIDENCE LIMIT	95% UPPER CONFIDENCE LIMIT
Mining and quarrying, including oil and gas field	1.46	1.33	1.6
Transport equipment operating	1.39	1.34	1.44
Processing (mineral, metal, chemical)	1.17	1.11	1.24
Fishing, hunting, trapping and related	1.16	0.64	2.1
Other crafts and equipment operating	1.12	1.03	1.21
Materials	1.11	1.06	1.15

handling and related, not elsewhere classified			
Artistic, literary, recreational and related	1.11	0.93	1.32
Machining and related	1.11	1.07	1.15
Other occupations	1.1	1.07	1.14
Clerical and related	1.09	1.05	1.13
Construction trades	1.09	1.06	1.13
Sales	1.06	1.03	1.09
Service	1.06	1.03	1.09
Social sciences and related fields	1.04	0.92	1.18
Forestry and logging	1.04	0.91	1.19
Managerial, administrative and related	1.03	0.93	1.15
Product fabricating, assembling and repairing	1.01	0.99	1.04
Processing (food, wood, textile)	1	0.94	1.05

Farming, horticultural and animal husbandry	0.88	0.81	0.96
Natural sciences, engineering and mathematics	0.85	0.76	0.96
Medicine and health	0.85	0.8	0.89
Teaching and related	0.61	0.55	0.68

Note: The hazard ratio is an estimate of the average time to diagnosis among workers in each industry/occupation group divided by that in all others during the study period. Hazard ratios above 1.00 indicate a greater risk of disease in a given group compared to all others. Estimates are adjusted for birth year and sex. The width of the 95% Confidence Interval (CI) is based on the number of cases in each group (more cases narrows the interval).

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